

**CALIFORNIA HOSPITAL-BASED
POST-NATAL MORTALITY:**

Assessing the Mortality Gap Between African Americans and Whites

Prepared by
Arthur A. Ellis, M.A., and
Gilberto Chavez, M.D., M.P.H.

Epidemiology Section
Maternal and Child Health Branch
Department of Health Services

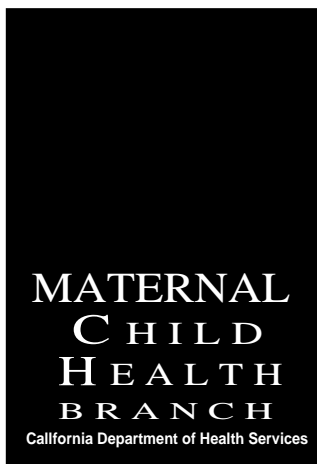
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Secretary, Health and Welfare Agency
Kim Belshe
Director, Department of Health Services

Rugmini Shah, M.D.
Chief, Maternal and Child Health Branch

Stephen W. Kessler
Deputy Director, Primary Care and Family Health

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CALIFORNIA HosPITAL-BASED POST-NATAL MORTALITY:
ASSESSING THE MORTALITY GAP BETWEEN
AFRICAN AMERICANS AND WHITES

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For additional copies, call or write to:

Maternal and Child Health Branch, Epidemiology Section
California Department of Health Services
714 P Street, Room 476
Sacramento, CA 94814
916/657-0324

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EXECUTIVE SUMMARY

The infant mortality gap between African Americans and whites is a subject of increasing concern that has captured the attention of health care providers and policy makers. An important component of infant mortality among African American infants consists of deaths in the hospital during the hospital stay after birth. During 1989, a total of 1,189 single-delivery live births were discharged dead from California hospitals. Of these, 57 percent fell into our African American (n=309) and white (n=711) comparison groups. The post-natal hospital-based mortality population constituted 60.6 percent of all neonatal mortality in California for 1989 (2,951 live births). Study highlights include the following:

- **DISCHARGE STATUS.** In all, 0.7 percent of live African American births died before hospital discharge, compared to 0.3 percent of whites and all other races.
- **PRESUMED CAUSE OF DEATH.** Disorders relating to short gestation and unspecified low birthweight were the most frequent probable causes of death (African Americans, 64.4 percent; whites, 62 percent), with respiratory distress syndrome, being the second, and intrauterine hypoxia and birth asphyxia third likely causes.
- **EXPECTED PRINCIPAL SOURCE OF PAYMENT.** For African American neonates, the three leading expected payers were Medi-Cal (41.8 percent), health maintenance organization (HMO) or prepaid health plan (PHP) (30.7 percent) and private insurance (12 percent); for white neonates, private insurance (30.4 percent), HMO or PHP (28.1 percent) and Medi-Cal (23.2 percent), were the three leading payers.
- **POST-NATAL MORTALITY RATE.** The hospital-based post-natal mortality rate (calculated by dividing hospital deaths by hospital live births and multiplying by 1,000) was 7.5 per 1,000 live births for African Americans and 2.8 for whites; thus, African American neonates were 2.6 times more likely to die than white neonates. African American neonates receiving care through private insurance were significantly more likely to die than those receiving care through publicly funded programs.
- **LENGTH OF STAY.** The average length of stay was 6.5 days for African Americans and 6.1 days for whites. African Americans with Medi-Cal and self-pay as their expected source of payment had longer stays. The vast majority of infants in this study died within 24 hours after being born: 71.8 percent of African Americans and 74.9 percent of whites fell into this category.
- **TOTAL HOSPITAL CHARGES.** Average charges for African Americans (\$21,717) and whites (\$21,214) were similar. Among African Americans, mean charges were substantially higher than whites for HMO or PHP (\$18,062 vs. \$8,947) and self-pay (\$12,881 vs. \$5,964), with African Americans having lower mean charges for the other major payers. Private insurance had the highest mean charges for both groups.

Accumulated hospital charges for cases with reported charges were \$5.2 million for African Americans and \$12 million for whites. Medi-Cal was expected to pay for 57.7 percent of total hospital charges for African Americans and 35 percent for whites. Private insurance was dominant for whites (44.2 percent) but not for African Americans (17.3 percent). Our estimate of total charges for all cases, including those that were unknown or were not reported, is \$6.5 million for African Americans and \$13.3 million for whites.

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Questions or comments may be directed to the authors at Department of Health
Services, Maternal and Child Health Branch, 714 P Street, Room 476, Sacramento,
California 95814, 916/657-0324.

INTRODUCTION

Infant mortality has declined substantially since 1915, from 95.7 per 1,000 live births to 10 in 1988.¹ Advances in medical technology account for much of this decline, yet, profound problems remain: This downward trend has slowed considerably in recent years, and the gap between white and African American infant mortality - the risk for African Americans is about twice that for whites - has not diminished. In addition, the United States ranked 20th in the world in infant mortality in 1988, far behind other industrialized nations.¹

Looking at the period 1948-1988, the infant mortality rate per 1,000 live births dropped - from 29.9 in 1948 to 8.5 in 1988 for whites and from 45.7 to 17.6 for African Americans.¹ Thus, on a nationwide basis, African American infants were more at risk to die than whites in 1988, than they were in 1948. African American infants were more than twice as likely as white infants to die in 1988, up from 1.5 times the risk of whites in 1948. Parallel findings have been seen in California, where the African American-white gap is larger.⁴ A modest decline in infant mortality rate (IMR) for all races was evident for the 1980-1988 period in California. For 1988, the rate was 18.4 for African Americans and 7.8 for whites.⁴

According to a report by the National Center for Health Statistics, the four leading causes of infant death in the United States for 1989, in descending order, were congenital anomalies, sudden infant death syndrome, respiratory distress syndrome, and disorders relating to short gestation and unspecified low birthweight. These four causes accounted for 54 percent of all infant deaths. The risk among African Americans was higher for all causes. For disorders relating to short gestation and low birthweight, African Americans were 4.5 times more likely to die than whites. This same distribution of causes and risks has been observed in California.¹

Birthweight is the most important predictor of infant survival. The National Commission to Prevent Infant Mortality reaffirmed that "the major key to reducing infant mortality is reducing the incidence of low birthweight babies." Although African American infants made up 16 percent of the 3.5 million single-delivery births in the United States in 1980, they accounted for 35 percent of all low birthweight infants and 28 percent of infants who died.² The continued high risk of death among African American infants prompted the development of the National Infant Mortality Surveillance (NIMS) Project for 1980, a database of linked birth and death certificates. Similarly, since the 1970s the California Department of Health Services (DHS) has kept a birth cohort file that permits the study of infant mortality based on variables such as race.

Findings from NIMS data for 1980 confirmed the infant mortality rate for African Americans as twice that of whites and found the gap to be related to a higher prevalence of low birthweight, a higher mortality risk in the neonatal period (0-27 days) for infants weighing up to 2,500 grams, and a higher risk of mortality in the post-neonatal period (28 days to 1 year) in all birthweight categories.⁷⁻⁹

With the specific goal of closing this gap, the California legislature appropriated funds in 1989 to review African American infant mortality and implement preventive strategies. The review was undertaken by the newly created California African American Infant Health Leadership Committee, which in 1991 produced the report *African American Babies Are Dying: A*

Call to Action. To implement preventive strategies, four community-based demonstration projects were funded.' Subsequently, DHS has provided additional funds to 16 health jurisdictions.

Most analyses of infant mortality have employed vital records (birth and death certificates). However, an important database, the California Hospital Discharge Database, has not previously been used in the study of African American-infant mortality and it can shed light on issues that have not been studied to date. Specifically, the purpose of this study was to examine the following questions:

- Is there a significant difference in the population at risk for post-natal mortality by race?
- Do the presumed causes of post-natal death vary by race?
- Who are the most prominent expected payers? Do they vary by race? Does post-natal mortality risk vary by race according to health insurance status?
- Does an association exist between race and length of hospital stay and total hospital charges in California?

METHODS

Data Source and Population

The California Office of Statewide Health Planning and Development (OSHPD) provided data for about 3.6 million hospital discharges from 1989. The data set represents all discharges from 580 general acute care hospitals, chemical dependency recovery hospitals, and psychiatric health facilities licensed to serve civilian patients during the year.

This study file comprised all single-delivery African American (n=309) and white (n=711) neonates who died before leaving the hospital. This group consisted of 57 percent of all (1,789 for all races) single-delivery live births subsequently discharged dead and 0.3 percent of all (541,032) single-delivery live hospital births for 1989.

Data Elements

Hospital Discharge Database variables used in this study are disposition at discharge, race/ethnicity, principal diagnosis, second diagnosis, expected principal source of payment, total charges and length of stay. (See the glossary for definitions of several of these variables.)

OSHPD has developed error tolerance levels for each data element (0.1 percent for most items). Correction is required if the percentage of error exceeds the tolerance level, but only down to these levels. If errors fall within the tolerance levels and the hospital chooses not to make corrections, OSHPD corrects each data element to a predetermined default value, such as blank or unknown.

OSHPD's Patient Discharge Data Section conducts studies of the reliability of hospital discharge data, the most recent dated December 1990. Data were reabstracted from selected medical records in 30 hospitals and were compared with the unedited data submitted by hospitals to OSHPD. Excluded from the study were obstetric, neonatal, psychiatric, and chemical dependency cases. The reliability was judged good for five of six variables studied (race, disposition, admission source, principal diagnosis, and principal procedure). The sixth was admission type with a disagreement rate of 36 percent. Findings are used to improve the accuracy of the data.

Analysis

Hospital deaths after single live births were the focus of this study. Thus, infant mortality was not studied per se because Sudden Infant Death Syndrome and out-of-hospital and post-neonatal deaths were not included in the data. The term *post-natal mortality rate* was used rather than *neonatal* or *infant mortality rate* to highlight this difference. First, live births discharged dead and alive for African Americans, whites and all other races were identified and compared. All subsequent analyses compared African Americans and whites discharged dead. The 10 leading presumed causes of death (second diagnosis) are listed for the comparison groups. Then, expected principal sources of payment for the comparison groups were identified.

Post-natal mortality rates (hospital deaths/hospital live births x 1,000) are presented for the major expected payers. Because only hospital deaths are analyzed, it is not surprising that these rates are lower than those reported in the literature for IMR. The denominator used to calculate all rates was total hospital live births for 1989 in California (541,031). These births were selected using ICD-9-CM codes V.30.0 and V.30.1 and accounted for 95 percent of the 569,308 total live births in the state. Data on comparative length of stay and total charges also are distributed by major expected payer.

FINDINGS

Hospital Discharge* Status

Table I lists the discharge status of African American, white, and all other races for 1989 California hospital live births. The number of African American infants who died before leaving the hospital was more than twice the number for whites (0.7 percent for African Americans and 0.3 percent for whites). (All tables reflect 1989 data in California unless indicated otherwise.)

Table I
DISCHARGE STATUS OF INFANTS

DISCHARGE STATUS	AFRICAN AMERICAN		WHITE		ALL OTHER RACES	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Alive	41,457	99.3	255,102	99.7	242,684	99.7
Dead	309	0.7	711	0.3	769	0.3
TOTAL	41, 766	100	255,813	100	243,453	100

Source: OSHPD, Hospital Discharge Data Program.

Presumed Cause of Death

Leading presumed causes of death are listed in Table 2, p. 8. (Actual cause of death is not given in the database; see the explanation of second diagnosis in the glossary.) Disorders relating to short gestation and unspecified low birthweight were the most frequent likely contributors to death (65.7 percent for African Americans and 62.8 percent for whites).

The next three most common presumed causes of death among African Americans were respiratory distress syndrome, congenital anomalies, and intrauterine hypoxia and birth asphyxia; among whites, they were congenital anomalies, respiratory distress syndrome, and intrauterine hypoxia and birth asphyxia. The difference between the races was substantial for the incidence of congenital anomalies, with African Americans (5.6 percent) less than half as likely to die of these as whites (11.4 percent).

Expected Principal Source of Payment

As indicated in Table 3, p. 8, Medi-Cal, health maintenance organization (HMO) or prepaid health plan, (PHP) private insurance, and self-pay were expected sources of payment for the hospital stay, including the birth, of 91 percent of African Americans and 93.1 percent of whites. African American live births discharged dead were nearly twice as likely to have Medi-Cal as the expected payer as were whites (41.8 percent vs. 23.2 percent). Conversely, African Americans had a comparatively smaller percentage of private insurance (12 percent vs. 30.4 percent) and self-pay (6.5 percent vs. 11.4 percent) cases than did whites.

Table 2
PRESUMED CAUSES OF DEATH PRIOR TO HOSPITAL DISCHARGE

SECOND DIAGNOSIS KD 9 CM (ODE) RANK ORDER		AFRICAN AMERICAN	WHITE
1	Disorders Relating to Short Gestation and Unspecified Low Birthweight (765)	65.7	62.8
2	Congenital Anomalies (740-759)	5.6	11.4
3	Respiratory Distress Syndrome- (769)	7.3	7.0
4	Intrauterine Hypoxia and Birth Asphyxia (768)	5.0	5.0
5	Respiratory Conditions of Fetus and Newborn, Other (770)	3.0	2.3
6	Conditions Originating in Perinatal Period, Other and Ill-Defined (779)	1.0	1.4
7	Slow Fetal Growth and Fetal Malnutrition (764)	2.0	0.8
8	Infections Specific to the Perinatal Period (771)	1.3	0.8
9	Newborn Affected by Complications of Placenta, Cord or Membranes (762)	1.6	0.6
10	Newborn Affected by Other Complications of Labor and Delivery (763)	0.7	0.8
11	All Others	6.8	7.1
TOTAL'		100 (303)	1100 (702)

15 cases (1.5 percent) did not have a second diagnosis.

Notes: Percentages may not add up to 100 because of rounding. ICD-9-M = International Classification of Diseases, 9th Revision, Clinical Modification.
Source: OSHPD, Hospital Discharge Data Program.

Table 3
**PRINCIPAL SOURCE OF PAYMENT FOR INFANTS WHO DIED PRIOR
TO HOSPITAL DISCHARGE**

PAYER'	AFRICAN AMERICAN		WHITE	
	NUMBER	PERCENT	NUMBER	PERCENT
Medicaid	129	41.8	165	23.2
HMO or PHP	95	30.7	200	28.1
Private Insurance	37	12.0	216	30.4
Self-pay	20	6.5	81	11.4
All Other	28	9.1	49	7.0
TOTAL	309	1100	711	100

' See glossary for definitions of the expected payers.

Note: Percentages may not add to 100 because of independent rounding.

Source: OSHPD, Hospital Discharge Data Program.

The same general findings reported above for all presumed causes were evident here also. For cases with low birthweight, however, Medi-Cal was the expected payer for a smaller percentage of African Americans (41.8 percent), and HMO or PHP was expected to pay for a larger percentage of whites (28.1 percent).

Post-natal Mortality Rate

The hospital-based post-natal mortality rate was 7.5 per 1,000 live births for African Americans and 2.8 for whites. As can be seen in Table 4, African American neonates were 2.6 times more likely to die than white neonates.

The African American mortality rate was higher than the white rate for the four major expected payers. For African Americans, self-pay had the highest rate (11.7), whereas Medi-Cal had the lowest (5.9); for whites, self-pay had the highest rate (34), with HMO or PHP having the lowest (2.3). At the high end of the rate ratios, African Americans were 3.5 times more likely to die than whites with private insurance; at the low end, African Americans were only 1.8 times more likely to die when covered by Medi-Cal.

Table-4
POST-NATAL MORTALITY RATE¹ By EXPECTED SOURCE OF PAYMENT/RACE

PAYER	AFRICAN AMERICAN	WHITE	RATE RATIO ²
Medi-cal	5.9	3.2	1.8
HMO or PHP	7.6	2.3	3.3
Private Insurance	8.7	2.5	3.5
Self-pay	11.7	34	3.4
TOTAL ³	7.5	2.8	2.6

¹Deaths in the hospital divided by hospital live births x 1,000.

²African American rate divided by white rate.

³Includes major and minor expected payers.

Source: OSHPD, Hospital Discharge Data Program.

Length of Stay

Most of the infants [included in](#) our study died within a 24 hour period, as shown in Table 5, p. 10: 71.8 percent for African Americans and 74.9 percent for whites. Within one week, 84.4 percent of African Americans and 86.7 percent of whites in the study were discharged dead within a week of birth.

The average (mean) length of stay was 6.5 days for African Americans and 6.1 days for whites. This difference was due to deliveries covered by Medi-Cal (2.6 days longer) and self-pay (1.6 days longer), because African Americans had shorter average stays for the other major payers. Medi-Cal patients had the longest average length of stay for African Americans (9.1 days), and those covered by private insurance had the longest average stay for whites (8.1 days) (Table 6, p. 11).

African Americans had 2,350 fewer accumulated hospital days than whites. The importance of Medi-Cal as a payer for African Americans is highlighted by the finding that, as Table 6 shows, only Medi-Cal was expected to pay for more days for African Americans than whites. Private insurance was the dominant payer for white stays because 65.1 percent (2,350) of the additional days for whites were expected to be paid for by that payer.

Table 5
LENGTH OF HOSPITAL STAY OF AFRICAN AMERICAN & WHITE NEWBORNS
PRIOR TO DEATH

DAYS	AFRICAN AMERICAN	WHITE
1	71.8	74.9
2-7	12.6	11.8
8-14	5.9	4.4
15-21	1.7	2.3
22-28	1.7	1.6
29+	6.3	4.9
TOTAL (number of days)	100 (309)	100 (711)

Note. Percentages may not add up to 100 because of rounding.
Source: OSHPD, Hospital Discharge Data Program.

Total Charges

Although average charges for African Americans and whites were similar, the difference between the means for the 0.4-day-longer average length of stay for African Americans was \$503. For African Americans, mean charges were substantially higher than for whites with HMO or PHP (\$9,115) and self-pay (\$6,917); for the other major payers, African Americans had lower mean charges. Private insurance had the highest mean charges for both groups, as Table 6 shows.

Accumulated hospital charges for cases with reported charges were \$5.2 million for African Americans and \$12 million for whites, with neither group having a disproportionate share. Again, the dominance of Medi-Cal for African Americans is apparent: 57.7 percent (\$3 million) of all hospital charges for African Americans (\$5.2 million) were expected to be paid by Medi-Cal. Medi-Cal also was an important expected payer for whites (\$4.2 million, or 35 percent), but private insurance was dominant (\$5.3 million, or 44.2 percent).

Data on total charges do not include cases where charges were not reported or were unknown. To approximate hospital charges for all cases, we applied the mean charges for HMO or PHP (\$8,947 for whites and \$18,062 for African Americans; most of those excluded were Kaiser cases) to total excluded cases (145 for whites and 71 for African Americans) resulting in \$1.3 million for both groups. Thus, adding the estimated and the reported amounts results in \$13.3 million for whites and \$6.5 million for African Americans.

Table 6
**LENGTH OF HOSPITAL STAY& ASSOCIATED COSTS FORAFRiCAn AMERICAN & WHITE
 NEWBORNS DYING PRIOR To DISCHARGE**

RACE/PAYER	AVERAGE LENGTH OF STAY	TOTAL HOSPITAL DAYS	MEAN CHARGES DAYS'	SUM OF HOSPITAL CHARGES'
Medi-(al				
White	6.5	1,077	26,340	4.2
African American	9.1	1,179	24,086	3.0
Difference	2.6	102	2,254	1.2
Private Insurance				
White	8.1	1,756	26,371	5.3
African American	6.1	226	24,256	0.9
Difference	2.0	1,530	2,115	4.4
HMO or PHP				
White	4.3	860	8,947	0.8
African American	3.7	353	18,062	0.6
Difference	0.6	507	9,115	0.2
Self-pay				
White	1.0	82	5,964	0.5
African American	2.6	51	12,881	0.2
Difference	1.6	31	6,917	0.3
ALL PAYEIRS3				
WHITE	61	4354	21 214	120
AFRICAN AMERI(AN	65	2002	21 717	52
DIFFERENCE	04	2350	503	68

¹ For newborns with total charges.

² Excludes cases with charges unknown or not reported; see text for an estimate of total.

³ Includes all minor payers.

Source: OSHPD, Hospital Discharge Data Program.

DISCUSSION AND CONCLUSIONS

This comparative study of African American and white infant deaths has several major findings. The finding that discharge status (dead vs. alive) is associated with race is consistent with the literature on African American infant mortality. African Americans were 2.6 times more likely to die in the hospital after birth than whites. Presumed causes of death in the study were comparable to causes of infant death given in the literature, although the order of importance differed.¹⁻⁴ Although infants of both races were more likely to die of disorders relating to short gestation and unspecified low birthweight than from any other cause, the percentage was higher for African Americans. For neonates, low birthweight is the most significant factor affecting African American infant mortality, according to the literature. The authors' findings support this belief.

Medi-Cal was the most prominent payer for African Americans, regardless of cause of death, and the third most frequent payer for whites. Private insurance was the most frequent expected payer for whites, and the third most frequent payer for African Americans. Other important expected payers for the comparison groups were HMO or PHP (with little difference between the comparison groups) and self-pay (with whites nearly twice as likely to fall into this category as African Americans). The African American mortality rates were substantially higher than those for whites for all prominent payers.

Among these prominent payers, self-pay had the highest mortality rates, followed by private insurance, HMO or PHP, and Medi-Cal. The high self-pay mortality rates, particularly for African Americans, may reflect the inability of women without private insurance or government programs to obtain adequate prenatal care and other health care services vital to the development of a normal child.

In addition, the self-pay rates may not be reliable and may fluctuate widely because of the relatively small numbers of neonates with this payment source.

The authors' findings of high post-natal mortality rates among the privately insured, working-class African American infants deserve attention by program and policy makers. They suggest that the infant mortality gap is not due solely to socioeconomic differences between African Americans and whites. Other determinants, such as social and environmental mechanisms, could play a significant role in this gap." Further research is needed to elucidate this problem.

The finding that African American Medi-Cal neonates had a mortality rate (5.9 per 1,000 live births) that was lower than African American patients of the other major payers was perplexing. In addition, the rate ratio indicated that African American Medi-Cal neonates had the best birth outcomes. Further analyses were conducted to shed light on this unexpected finding, using additional hospital discharge data for 1988 and 1990. (The data for 1990 became available while this study was in progress.)

Table 7, p. 14, gives mortality rates, by expected payer, for all three years. It is clear that the findings for 1989 were not aberrations. Only the rates for Medi-Cal declined consistently, from 7.2 for 1988 to 5.5 for 1990. The rate ratio declined from 2.2 for 1988 to 1.8 for 1989 and

Table 7
AFRICAN AMERICAN POST-NATAL MORTALITY RATE BY
EXPECTED PAYER/RACE, 1989-1990

	MORTALITY RATE'			RATE RATIO'		
	1988	1989	1990	1988	1989	1990
Medi-Cal	7.2	5.9	5.5	2.2	1.8	1.8
HMO or PHP	6.3	7.6	7.2	2.7	3.3	3.3
Private Insurance	6.4	8.7	4.4	2.7	3.5	2.1
Self pay	7.8	11.7	13.0	2.6	3.4	4.5
TOTAL	72	75	66	27	26	28

Deaths in the hospital divided by hospital live births x 1,000.

1990. Looking at the number of African American neonates discharged dead, only Medi-Cal registered a consistent drop across the 3-year period, from 142 to 128 for 1990.

These statewide data are heavily influenced by hospitals in Los Angeles County. More than half (51.9 percent) of African American neonatal mortality in this study occurred in Los Angeles County hospitals, compared to 27.3 percent for white neonates. Of the 67 African American decedents in Los Angeles, 45 (67.2 percent) were born in just six hospitals, principally in the south and south-central portions of the county.

The infant mortality rate has been falling in Los Angeles County, most prominently for African American babies, and this trend has been attributed to expanded access to prenatal care for the poor, additional fees paid to physicians who treat Medi-Cal patients, and agreements with private hospitals and doctors to relieve overcrowded maternity wards at county hospitals. These findings suggest that programs aimed at those receiving care through Medi-Cal may have been effective in reducing the mortality gap for African American babies.

Accumulated hospital charges, \$5.2 million for African Americans and \$12 million for whites, exclude a high percentage of cases where charges were unknown or were not reported: 23 percent for African Americans and 20.3 percent for whites. Most of these exclusions were HMO patients: 87.3 percent for African American and 75.9 percent for white neonates. Accounting for these unusually high percentages might be the extremely brief hospitalization period for these neonates. More than 7 in 10 were discharged dead on the same day or within one day of birth; some babies dying immediately after birth do not incur any charges, with hospital charges being assessed to the mothers. Estimates for these exclusions increase these totals to \$6.5 million for African Americans and \$13.3 million for whites. However, these are 1989 dollars. To adjust for inflation, a conservative 15 percent rate (medical inflation ran between 15 and 20 percent annually for 1990 and 1991) was used, resulting in \$11.4 million for African Americans and \$23.3 million for whites in 1993 dollars,

In summary, this study examined unique population-based data on post-natal mortality. Several findings may have useful health policy implications, among them the following:

- Most neonatal mortality takes place within the first week after birth.
- Existing programs aimed at economically disadvantaged African American women may have begun to reverse the African American-white gap in post-natal mortality.
- Middle-class African American women need to be targeted with effective, culturally competent preventive efforts to reduce the high post-natal mortality rates among private insurance patients.

Further research is needed to clarify the impact that the existing preventive programs have on infant mortality and to define the reasons for the large African American-white gap in mortality among women with private insurance.

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GLOSSARY

EXPECTED PRINCIPAL SOURCE OF PAYMENT: The anticipated payer for all services rendered in the hospital. The contribution of all payers is described, but only the major expected payers were used in the analyses: Medi-Cal, private insurance, health maintenance organization or prepaid health plan (HMO or PHP), and self-pay. These four were expected to pay for 92 percent of all infants in this study. Medi-Cal is California's Medicaid program. Private insurance is the combination of the OSHPD codes for the Blue Cross/Blue Shield insurance company. For self-pay, payment is expected to be made by the patient, relatives or friends.

Minor expected payers were defined as the following:

"Other government" consists of Short-Doyle and CHAMPUS, the insurance plan of U.S. armed forces dependents.

"Other non-government" is other third-party payment not listed in Table 4, such as self-funded plans or organized charities.

"Medically indigent services" is payment for services rendered to persons certified eligible under Welfare and Institutions Code 17000, including payment for indigent care made directly by counties and payment rendered to county medical services programs by the state's fiscal intermediary.

In the "No Charge" category, no payment is expected. This includes free, charity, and special research cases.

PRINCIPAL DIAGNOSIS: The condition determined, after study, to be chiefly responsible for hospital admission and coded according to the conventions of the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM). In all cases in this study, the principal diagnosis was single-delivery live birth.

SECOND DIAGNOSIS: The next diagnosis following the principal diagnosis that contributed to length of stay and total charges. A second diagnosis was recorded in 98.5 percent of our cases. The second diagnosis was used as a surrogate for presumed or likely cause of death. Although it cannot be said definitively that the second diagnosis was the cause of death, in most cases it can be assumed to be an important factor or contributor. Cause of death is not a data element in the Hospital Discharge Database.

TOTAL CHARGES: Consists of all charges for services rendered, except physicians' fees, during the last 365 days of the hospitalization. Total charges overstate actual revenue to the hospital. Figures only include cases for which data on total charges are available. To approximate the total, charges were estimated for excluded cases using the mean for HMO or PHP as described below.

Data on mean charges are based on cases with total charges reported; cases where total charges were not reported or were unknown are excluded. A total of 71 African American and 145 white cases were excluded, 23 percent and 20.4 percent of all African American and white cases, respectively. The preponderance of the excluded cases were HMO or PHP cases (62 cases or 87.2 percent for African Americans and 10 cases or 75.9 percent for whites) because Kaiser-Permanente has been exempted from reporting total charges. Shriner hospitals are exempt also. Without excluding these cases, mean charges would be artificially low; therefore, these exclusions increase the validity of the data.